

## Superfund graduate trainees win foundation support

By Sarah Wilkinson

The careers of University of Arizona (UA) graduate students [Linnea Herbertson](http://arizona.academia.edu/LinneaHerbertson) (<http://arizona.academia.edu/LinneaHerbertson>) and [Corin Hammond](http://www.portal.environment.arizona.edu/students/profiles/corin-hammond) (<http://www.portal.environment.arizona.edu/students/profiles/corin-hammond>) gained momentum this spring, with announcements of support by the [National Science Foundation \(NSF\)](http://www.nsfgrfp.org/) (<http://www.nsfgrfp.org/>) and the [Achievement Rewards for College Scientists \(ARCS\) Foundation](https://www.arcsfoundation.org/). (<https://www.arcsfoundation.org/>) Both Herbertson and Hammond are graduate trainees in the UA Superfund Research Program (SRP), working on doctoral degrees in the environmental health sciences, with a field research focus on phytostabilization of mine tailings at the Iron King Mine and Humboldt Smelter Superfund Site in Dewey-Humboldt, Ariz.

### NSF fellowship support for Herbertson

Herbertson received a 2013 NSF Graduate Research Fellowship Program award. As an NSF fellow, she will receive three years of funding support, including stipend, travel, and tuition, and have access to a variety of professional development activities.

“My concern for the environment began when I was a child,” said Herbertson. When she entered graduate school, she joined the environmental microbiology laboratory of [Raina Maier, Ph.D.](http://superfund.pharmacy.arizona.edu/content/faculty&id=16), (<http://superfund.pharmacy.arizona.edu/content/faculty&id=16>) director of the UA SRP, to combine her scientific interests with her passion for the environment. Herbertson’s research explores whether the bacterial community on the roots of plants grown in mine tailings can aid in the sequestration of toxic metals, as well as act as an indicator of plant health and phytostabilization vitality.

After collecting plants grown in the mine tailings, she images the roots using fluorescent *in situ* hybridization, to characterize the microbial communities and X-ray fluorescence to analyze metals. “I hope my research will help to further our understanding of the mechanisms of bacteria, root, and metal interactions, to help improve phytostabilization efforts,” Herbertson said.

### ARCS scholarship support for Hammond

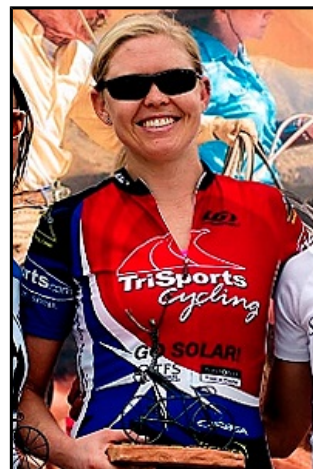
Hammond received a scholarship from the Phoenix chapter of ARCS for the 2013-2014 academic year. Her award will provide tuition, travel funds, and a stipend.

Hammond is a doctoral student training in the environmental chemistry lab headed by UA SRP lead researcher [Jon Chorover Ph.D.](http://ag.arizona.edu/SWES/people/cv/chorover.htm) (<http://ag.arizona.edu/SWES/people/cv/chorover.htm>) Her graduate work is focused on characterizing the biogeochemical transformation of metal(loid)s during phytostabilization of mine tailings.

“Phytostabilization is complicated by the inhospitable environment the mine tailings provide to germinating plants,” Hammond explained. High acidity, high heavy metal content, and low organic matter content are among the factors that complicate the phytostabilization process. To assess the changes in biogeochemistry associated with the phytostabilization strategy, members of Chorover’s lab analyze soil cores, by laboratory and synchrotron X-ray techniques, to investigate contaminant transport and soil genesis as a function of time and depth.

“I am so fortunate to be selected by the ARCS Phoenix chapter to receive this financial support. It is an inspiration to see our community leaders finance higher education and research that leads to a more sustainable future,” Hammond said of her award.

([Sarah Wilkinson, Ph.D.](http://www.pharmacy.arizona.edu/directory/sarah-wilkinson-phd), (<http://www.pharmacy.arizona.edu/directory/sarah-wilkinson-phd>) is the research translation coordinator for the UA SRP, who writes and edits the UA [SRP News and Highlights](http://www.superfund.pharmacy.arizona.edu/recent_newspage). ([http://www.superfund.pharmacy.arizona.edu/recent\\_newspage](http://www.superfund.pharmacy.arizona.edu/recent_newspage)))



An avid cyclist, Herbertson often rides by the extensive mine tailings south of Tucson, Ariz., near Green Valley. “On especially windy days, I smell and taste the tailings in the air blowing from the piles,” she said. “Such experiences leave me wondering — how does one address this issue?” (Photo courtesy of Linnea Herbertson)



For Hammond, environmental advocacy is in the blood. She grew up in Corvallis, Ore., a town she describes as particularly environmentally aware. Hammond plans to complete her doctorate in December 2014. (Photo courtesy of Corin Hammond)

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